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09/884,031	06/20/2001	Tai-Her Yang	YANG3007/EM/6915	2723

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EXAMINER	
LUK, LAWRENCE W	
ART UNIT	**PAPER NUMBER**
2838	

DATE MAILED: 12/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/884,031	Applicant(s) YANG, TAI-HER	
	Examiner Lawrence W Luk	Art Unit 2838	

-- The MAILING DATE of this communication appears on the cover sh et with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 23-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 2* is/are rejected.

7)☒ Claim(s) *3-21 and 23-29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Objections

1. The claims 4, 6, 7, 10-20 and 24 are objected to because they include reference characters which are not enclosed within parentheses.

Reference characters corresponding to elements recited in the detailed description of the drawings and used in conjunction with the recitation of the same element or group of elements in the claims should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. See MPEP § 608.01(m).

2. Claims 3-21 and 23 objected to because of the following informalities:

- 'A storage/discharge device' should be ' A charge/discharge device'

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace (4,651,080) in combination with Hobbs (4,951,255).

As to claim 1, Wallace disclose in figure 3, column 3, lines 22-56, a charge/ discharge device integral with a low impedance current pool structure, for application in a primary cell, or in a secondary rechargeable/dischargeable cell, or still in a fuel cell or in a capacitor or in a super capacitor, similar charging/discharging device, but fail to teach one or more current pool means to yield multiple current converging paths; a tank of dissimilar polarity electrode.

Hobbs disclose in figure 1B, column 9, lines 23-47, one or more current pool means to yield multiple current converging paths characterized in connecting in parallel current confluent terminals as provided in tanks of like polarities, in tanks of unlike polarities but of identical voltage specifications, and those on electrode boards of like polarities, or alternatively in connecting in series or in compound serial/parallel connections current confluent terminals between electrode boards of unlike polarities in tanks of dissimilar electrodes; and in that the exterior sides of the electrode boards of either positive or negative polarity furnished on either side of each individual electrode tank are produced into such a low impedance texture such that it is made advantageous to confluent currents, be it incoming or outgoing.

It would have been obvious to person having ordinary skill in the art at the time of the invention was made to modify the device of Wallace to include one or more current pool means to yield multiple current converging paths as taught by Hobbs for providing each such pair, and they can share a common current sink although each has a separate impedance path control connecting it to that current sink.

As to claim 2, Hobbs disclose in column 9, lines 49 to column 10, line 17, a low impedance current pool structure further is connected into a tank of identical polarity electrodes, or a tank of dissimilar polarity electrodes by means of coupling conductors, whereof said current pool terminals of identical potentials and identical polarity are in parallel, or serving to be connected with current pooling terminals between electrode boards of dissimilar polarities in a tank of dissimilar electrodes, executed in serial connection or compound serial/parallel connection.

Allowable Subject Matter

5. Claims 3-29 are objected to as being dependent upon a rejected base claim. The prior art of record fails to teach or reasonably suggest that:

As to claim 3, characterized in that the positive or negative polarity electrode board can be composed of other low impedance materials where needed different from those low impedance structure disclosed in the foregoing in respect of its exteriority, and as part of which the current pool terminals for input/output purposes can be provided singly or plurally, on single side or on more than one side.

As to claim 4, a device having one or more piece of paralleled positive electrode board (P100) and as matched thereto, one or more piece of paralleled negative electrode board (P100), set in individual electrode tanks to constitute individual electrode pairs, then have flat plate form current pool conductor assembly of chosen material and made to specified thickness installed way between respective current pool terminals on the exteriority of positive or negative electrode board (P200) on both sides

of each individual electrode tank, so that it is made that the impedance prevalent way between the current pool terminals on the periphery of the external positive or negative electrode board (P200) is inferior to that impedance prevailing across the normal electrode surface duly applied with one layer of chemically active material in lattice configurations on the same electrode board.

As to claim 5, the exteriority of the external electrode board in respective individual electrode tank is processed into a current pool conductor in the form of a plank lamina or thickened lamina of uniform elements or non-uniform elements processed to present a slope.

As to claim 6, the outside of the positive or negative electrode board (P200) on both sides of the individual present in the independently installed electrode tank, way between respective current pool terminals (T100), is processed straight into webform conductor assembly of chosen thickness.

As to claim 7, the individual electrode pairs formed in the independently installed electrode tank, way between the current pool terminals outside the positive or negative polarity electrode board (P200) on both sides, pieces or webform or stripe form current pool conductor assembly are interconnected by soldering, welding, riveting, screw coupling, prestressed bonding, internal burial, laying or otherwise technique, in order that the impedance prevailing between the current pool terminals (T100) on the perimeter of the externally provided positive or negative polarity electrode boards be controlled inferior to the impedance on the normal electrode surface on the other side of the same electrode board that is applied with a lattice work of chemically active coating.

As to claim 8, the electrode board with plate form terminals on the outside is good for connection to two or more than two independent electrode tanks, and hence good for like polarity on like polarity paralleling or opposite polarity serial connection under the same voltage specifications.

As to claim 9, the side of the externally provided plate-form terminal electrode board meant to couple with current pool terminals coming from other electrode tanks may be mounted two or more than two current pool terminals to thereby account for multiple coupling possibilities so that impedance is lowered in the long run.

As to claim 10, the current conductor assembly outside the positive or negative electrode board (P200) on both sides of the individual electrode tank in particular, are provided two current pool terminals (T100) to accommodate serial or parallel combination with each electrode tank where multiple sets of electrode tanks are deployed for application.

As to claim 11, a view to further reduce the impedance on the part of both the current pool terminal and of the electrode board, a feasible approach is to process the current pool terminal trapezoidal extending outwardly, such that the wider base of the trapezoidal current pool terminal is coupled to the electrode board, whereby the internal impedance on the terminal, output or input, of the electrode board, is duly reduced.

As to claim 12, two trapezoidal current pool terminals two in the middle of one external side of the positive or negative electrode board (P200) on both sides of the individually installed electrode tank, just to make for a correspondent positive or negative electrode pair with the electrode board.

As to claim 13, trapezoidal current pool terminals (T100) are provided on both sides of the exteriority of the positive or negative electrode board (P200) on both sides of each individual electrode tank, to form electrode pair with electrode board symmetrically.

As to claim 14, on either of both external sides of the positive or negative electrode board (P200) on both sides of individual electrode tank are installed two trapezoidal current pool terminals (T100), extending outwardly, characterized in that a dimensional differential exists between the hunch peak of current pool terminals on the same sides of the trapezoid and the edges on both sides of the electrode board so that once an electrode pair is produced by superposing the backsides of the two similarly configured electrode boards, interwoven superposition is made involving the positive/negative polarity electrodes of adjacent electrode boards, with current pool terminals (T100) intercrossing but not intervening each other, so as to facilitate interactive coupling, with better current pooling effects realized on the basal area of the wider trapezoid.

As to claim 15, three externally extending trapezoidal current pool terminals (T100) on each external side of the positive or negative polarity electrode board (P200) on both sides of the electrode tank, characterized in that a dimensional differential exists between the hunchback of current pool terminals on the same side of the trapezoid and the edges on both sides of the electrode board.

As to claim 16, a device an outwardly extending trapezoidal current pool terminal (T100). on two opposite sides of a quadrilateral positive or negative electrode board

(P200) on both sides of individually installed electrode tank, characterized in that a dimensional differential is maintained between the hunch peak of current pool terminals on the same sides of the trapezoid and the edges on both sides of the electrode board so that once an electrode pair is formed by superposing the backsides of the two similarly configured electrode boards, interwoven super-positions is made involving the positive/negative polarity electrodes of adjacent electrode boards, with current pool terminals (T100) intercrossing but not intervening each other, so as to facilitate interactive coupling, with better current pooling effects realized on the basal area of the wider trapezoid.

As to claim 17, two outwardly extending trapezoidal current pool terminals (T100) on two opposite sides of a quadrilateral positive or negative electrode board (P200) on both sides of individually installed electrode tank, characterized in that a dimensional differential is maintained between the hunch peak of current pool terminals on the same sides of the trapezoid and the edges on both sides of the electrode board so that once an electrode pair is formed by superposing the backsides of the two similarly configured electrode boards, interwoven super-positions is made involving the positive/ negative polarity electrodes of adjacent electrode boards, with current pool terminals (T100) intercrossing but not intervening each other, so as to facilitate interactive coupling, with better current pooling effects realized on the basal area of the wider trapezoid.

As to claim 18, three outwardly extending trapezoidal current pool terminals (T100) on two opposite sides of a quadrilateral positive or negative electrode board

(P200) on both sides of individually installed electrode tank, characterized in that a dimensional differential is maintained between the hunch peak of current pool terminals on the same sides of the trapezoid and the edges on both sides of the electrode board so that once an electrode pair is created by superposing the backsides of the two similarly arrayed electrode boards, interwoven superposition is made involving the positive/negative polarity electrodes of adjacent electrode boards, with current pool terminals P100 intercrossing but not intervening each other, so as to facilitate interactive coupling, with better current pooling effects realized on the basal area of the wider trapezoid.

As to claim 19, an outwardly extending trapezoidal current pool terminal (T100) on two opposite sides of a quadrilateral positive or negative electrode board (P200) on both sides of individually installed electrode tank, characterized in that a dimensional differential is maintained between the hunch back of current pool terminals on the same sides of the trapezoid and the edges on both sides of the electrode board so that once an electrode pair is created by superposing the backsides of the two similarly configured electrode boards, interwoven superposition is made involving the positive/negative polarity electrodes of adjacent electrode boards, with current pool terminals (P100) intercrossing but not interfering each other, so as to facilitate interactive coupling, with better current pooling effects realized on the basal area of the wider trapezoid.

As to claim 20, two outwardly extending trapezoidal current pool terminals (T100) on two opposite sides of a quadrilateral positive or negative electrode board (P200) on both sides of individually installed electrode tank, characterized in that a dimensional

differential is maintained between the hunch back of current pool terminals on the same sides of the trapezoid and the edges on both sides of the electrode board so that once an electrode pair is created by superposing the backsides of the two similarly configured electrode boards, interwoven superposition is made involving the positive/negative polarity electrodes of adjacent electrode boards, with current pool terminals (P100) intercrossing but not interfering with each other, so as to facilitate interactive coupling, with better current pooling effects realized on the basal area of the wider trapezoid.

As to claim 21, in its application to quadrilateral or nearly quadrilateral electrode boards, apart from the provision of current pool terminals on two or four sides, it is also feasible to provide current pool terminals on three sides of the electrode board too, and the configuration of said electrode board is not restricted to a quadrilateral only, indeed it can instead take the form of a circle, a near circle, an ellipse, a near ellipse, a triangle, a polylateral, including without limitation: triangle, quadrilateral, quintuple lateral, hexagon, septuple lateral, octuple lateral, with each electrode board furnished with two or more than two current pool terminals so that each electrode board is equipped with two or more than two current pooling loops.

As to claim 23, the input/output current pool terminals on the positive, negative electrode boards on both sides of the electrode tank which, as required, may be installed singly or plurally, on one side or on more sides, all the other electrode boards can be structured such that one or more current pool terminal individually extending outwards are installed on two or more than two sides on individual electrode boards;

As to claim 24, low impedance current pool conductive structure includes plate or strip or web form structure for connection to respective output/input current pool terminals (T100) of which individual electrode tanks are installed outside the positive or negative polarity electrode board (P200), on both sides of the electrode tank, or other low impedance current pool conductor assembly made of chosen materials in otherwise geometrical configurations.

As to claim 25, low impedance current pool conductive structure includes plate or strip or web form structure for connection to respective output/input current pool terminals of which individual electrode tanks are installed outside the positive or negative polarity electrode boards on both sides of the electrode tank, with areas between consecutive output current pool terminals interconnected by welding, soldering, riveting or screwing technique, or prestressed, or burial or inlay or otherwise means, to facilitate pooling of input/output currents, or other low impedance current pool conductor assembly of chosen material in otherwise geometrical configuration.

As to claim 26, low impedance current pool conductive structure includes plate or strip or web form structure with output/input current pool terminals associated with the overall storage/discharging device being installed outside the positive or negative polarity electrode board on both sides of the electrode tank, to facilitate transiting of incoming/outgoing current pool, or low impedance current pool conductor assembly of chosen material but otherwise geometrical configuration, said plate form encompassing thickened board of uniform or non-uniform, tilted sheets.

As to claim 27, low impedance current pool conductive structure includes current pool terminals for input/output purposes secured by soldering, welding, riveting, screwing, prestressing technique or by burial, inlay or otherwise means among themselves, established outside the positive or negative polarity electrode boards on both sides of the electrode tank, led to correspondent terminals on the master storage/Discharge Assembly, in plate or strip or web form to facilitate pooling of incoming/outgoing currents, being a low impedance conductive assembly of a chosen geometry or otherwise materials.

As to claim 28, low impedance current pool conductive structure includes interconnect pieces or bars of conductors of a chosen geometry and of chosen materials interposed between parallel conductors between sets of input/output current pool terminals on a plurality of electrode boards of like polarities.

As to claim 29, low impedance current pool conductive structure includes interconnect pieces or bars of chosen geometry and material incorporated additionally between a plurality of serially parallelly connected conductors on input/output current pool terminals on sets of electrode boards of dissimilar polarities.

Claims 4-21, 23-29 would be allowable if rewritten in independent form including all the limitation of the base claim and any intervening claims.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Luk whose telephone number is (703)305-0617. The examiner can normally be reached on 7 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on (703) 308-1680. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-7724 for regular communications and (703)305-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-1782.

LWL
December 24, 2003

Lawrence Luke
examiner
12/24/03